

AMENDMENT TO THE CLAIMS

This listing of claims will replace all prior versions of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A ~~magnetic head-coil structure~~ formed during the process of manufacturing a magnetic head, comprising:

an insulating layer;

a photoresist layer deposited on the insulating layer;

a silicon dielectric layer deposited on the photoresist layer, the silicon dielectric layer having at least one channel formed therein;

a conductive material formed in the at least one channel to define a coil structure;

wherein a grain size of the conductive material is less than half of a smallest dimension of the at least one channel.

2. (Original) The coil structure as recited in claim 1, wherein the insulating layer includes Al_2O_3 .

3. (Currently Amended) The coil structure as recited in claim 1, further comprising a conductive seed layer, wherein the conductive seed layer includes Cu.

4. (Original) The coil structure as recited in claim 1, wherein the conductive material includes Cu.
5. (Currently Amended) The coil structure as recited in claim 1, wherein ~~[[a]]the~~ grain size of the conductive material is less than 0.25 μ m but greater than zero~~half of a smallest dimension of the at least one channel.~~
6. (Currently Amended) The coil structure as recited in claim 1, further comprising a conductive seed layer, wherein a resistivity of the conductive seed layer is less than or equal to 8.3 micro-ohm/cm.
7. (Original) The coil structure as recited in claim 1, wherein the silicon dielectric layer includes SiO₂.
8. (Currently Amended) The coil structure as recited in claim 1, wherein the at least one channel includes a slope greater than one (1) but less than infinity.
9. (Currently Amended) The coil structure as recited in claim ~~[[1]]~~8, wherein the slope of the at least one channel facilitates depositing of ~~[[the]]~~a conductive seed layer and the conductive material.

10. (Original) The coil structure as recited in claim 1, wherein an aspect ratio of the at least one channel is at least 7.
11. (Original) The coil structure as recited in claim 1, wherein the channels are formed by masking, wherein the masking includes depositing another photoresist layer.
12. (Original) The coil structure as recited in claim 1, wherein at least a portion of the silicon dielectric layer has been removed.
13. (Original) The coil structure as recited in claim 12, wherein the silicon dielectric layer has been removed by chemical-mechanical polishing (CMP).
14. (Original) The coil structure as recited in claim 1, and further comprising an adhesion promoter layer between the silicon dielectric layer and the photoresist layer.
15. (Currently Amended) The coil structure as recited in claim ~~[[1]]12~~, wherein the silicon dielectric layer has been removed by reactive ion plasma etching conductive seed layer includes a magnetic material.

16. (Currently Amended) The coil structure as recited in claim [[1]]8, wherein a reactive ion milling process defines the slope ~~the conductive material includes a magnetic material.~~
17. (Currently Amended) The coil structure as recited in claim [[16]]8, wherein side walls of the at least one channel taper inwardly from a top to a bottom of the at least one channel to define the slope ~~the magnetic material is selected from the group consisting of NiFe, CoFe, and CoNiFe.~~
18. (Original) The coil structure as recited in claim 1, wherein the coil structure includes a P2 pole tip structure.
19. (Original) A disk drive system, comprising:
a magnetic recording disk;
a magnetic head including a coil structure as recited in claim 1;
an actuator for moving the magnetic head across the magnetic recording disk so the magnetic head may access different regions of the magnetic recording disk; and
a controller electrically coupled to the magnetic head.
20. (Currently Amended) A magnetic head coil structure manufactured utilizing a process, comprising:
depositing an insulating layer,

depositing a photoresist layer on the insulating layer;
depositing a silicon dielectric layer on the photoresist layer;
masking the silicon dielectric layer;
etching at least one channel in the photoresist layer and the silicon dielectric layer;
depositing a conductive seed layer in the at least one channel; and
filling the at least one channel with a conductive material to define a coil structure;
wherein a grain size of the conductive material is less than half of a smallest dimension of the at least one channel.

21. (Original) A disk drive system, comprising:
a magnetic recording disk;
a magnetic head including a coil structure as recited in claim 20;
an actuator for moving the magnetic head across the magnetic recording disk so the magnetic head may access different regions of the magnetic recording disk; and
a controller electrically coupled to the magnetic head.

22. (Withdrawn) A magnetic head coil structure manufactured utilizing a process, comprising:
depositing a conductive layer;
depositing a photoresist layer on the conductive layer;

depositing a silicon dielectric layer on the photoresist layer;
masking the silicon dielectric layer;
etching at least one channel in the photoresist layer and the silicon dielectric layer;
filling the at least one channel partially with a conductive material; and
removing the photoresist layer, the silicon dielectric layer, and the conductive layer to define the magnetic head coil structure.